The remaining storm is the one mentioned above, of November 22, 1909, when the usual southerly winds were replaced by westerly.

During the three-year period for which records are available at Cape Mala three tropical cyclones occurred. The first one was reported September 19, 1920, in 16° N. and 85° W. Constant southerly winds blew at Cape Mala for the four-day period, September 17–20, inclusive, and at Colon for the two days, September 17–18. The second was reported on June 15, 1921, in 14° N. and 81° W. At Cape Mala southerly winds blew for two days, the 16th and 17th, and at Colon for one day, the 16th.

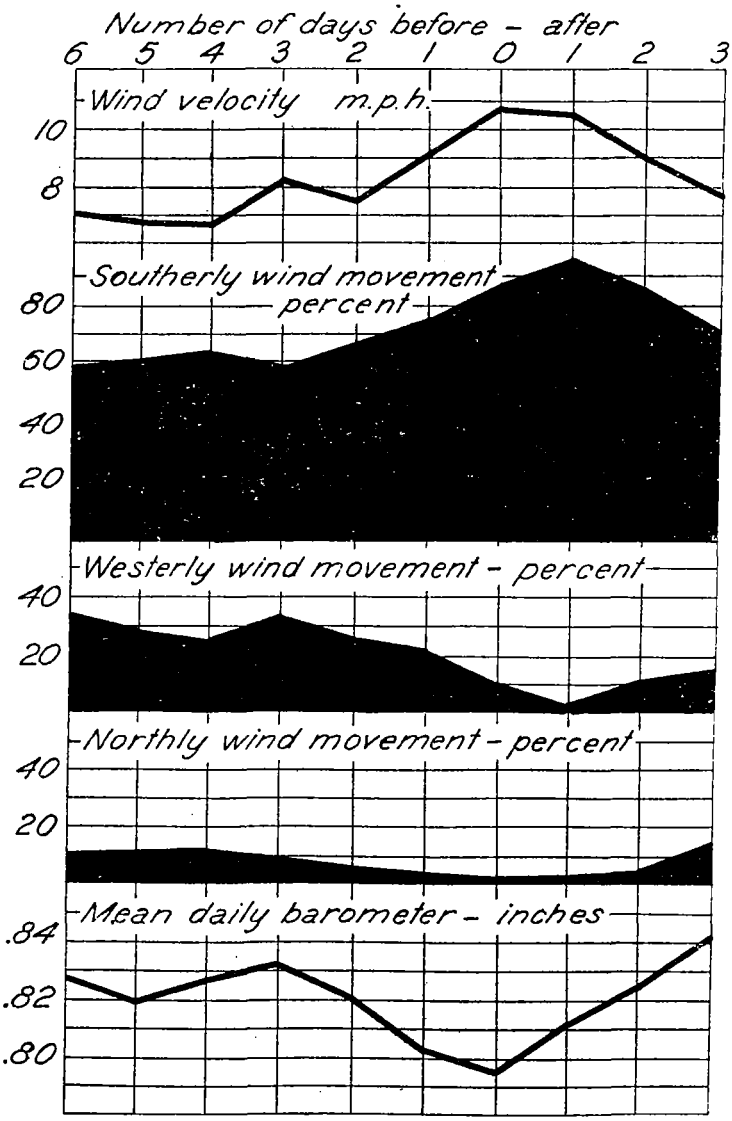


FIG. 10.—Mean daily wind and barometer at Colon for 10-day period at time of formation of tropical cyclones in western Caribbean south of latitude 15° N.

The third storm was reported on October 21, 1921, in 14° N. and 81° W. At Cape Mala the wind blew constantly from southerly points for seven days, the 18th to 24th, inclusive, with daily means ranging from 14 to 21 miles per hour. At Colon southerly winds obtained for four days, the 18th to 22d, inclusive, with daily means ranging from 7 to 18 miles per hour.

Free-air data at Coco Solo are available during the formation of two tropical cyclones. At the time of the formation of the cyclone of October 17, 1924, in 15° N. and 84° W., observations are available from the 13th to the 18th, and up to the 3,000-meter level. Velocities were light at all levels. The direction at the surface was southeast and south-southeast and mostly south to southwest above 1,000 meters.

Several balloon flights to 1,500 meters are available near the time of formation of the cyclone of October 17, 1926, in 12° N. and 80° W. October 16, at 7 a. m., the wind varied from SE. 8 at the surface to a maximum of S. 31 at 750 meters and SSW. 28 at 1,500 meters. October 18, at 7 a. m., the velocity was SE. 19 at the surface and held at SSE. 34 at the 500, 750, and 1,000 meter levels. By 7 a. m. the 19th the wind had fallen to ESE. 9 at the surface, SE. 26 at 500 meters, and SE. 19 at 1,500 meters.

RELATION BETWEEN SOUTHERLY WINDS AND HURRICANE FORMATION

In a comparison of southerly winds at Colon with the time of hurricane formation it is noted that for storms first reported north of latitude 15° the maximum of southerly winds at Colon usually precedes the first report by one or two days; but for storms originating south of latitude 15°, or within 300 miles of Colon, the maximum usually occurs on the day of reported formation or the day following. In other words, as far as the near-by storms are concerned, a cyclonic circulation actually exists and has been identified as such before the maximum of southerly wind occurs at Colon.

A comparison of all available records at Colon and Cape Mala indicates that the initial momentum of these southerly winds originates somewhere in the South Pacific, and that they extend northward with diminishing velocity, and are entirely independent of the existence of any cyclonic formation, but that the appearance of any pronounced maximum at Colon is dependent upon the development and northward progress of a cyclonic circulation. According to fishermen and turtlers familiar with the southwestern Caribbean, the most obvious feature locally at the time of the formation of a tropical cyclone is frequently the southeast gales that persist, sometimes for several days, after the storm has passed. It would appear that the existence of a following wind in the wake of the moving storm, but distinct from the cyclonic circulation itself, is a reality, and that the influence of this wind in intensifying the already existing southerly winds over the Isthmus of Panama produces the comparatively high velocities which is their most noticeable feature.

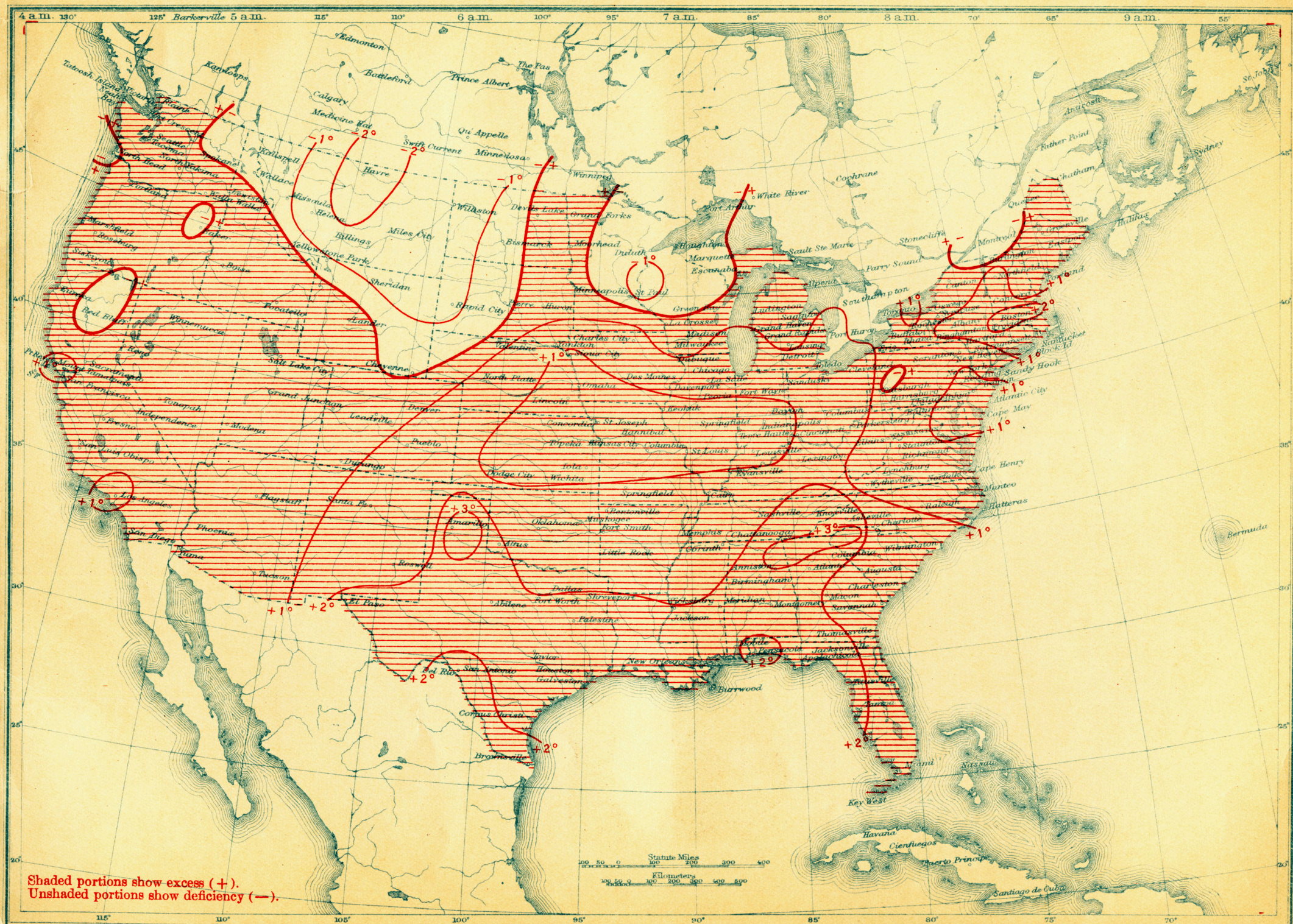
THE WEATHER OF 1927 IN THE UNITED STATES

By ALFRED J. HENRY

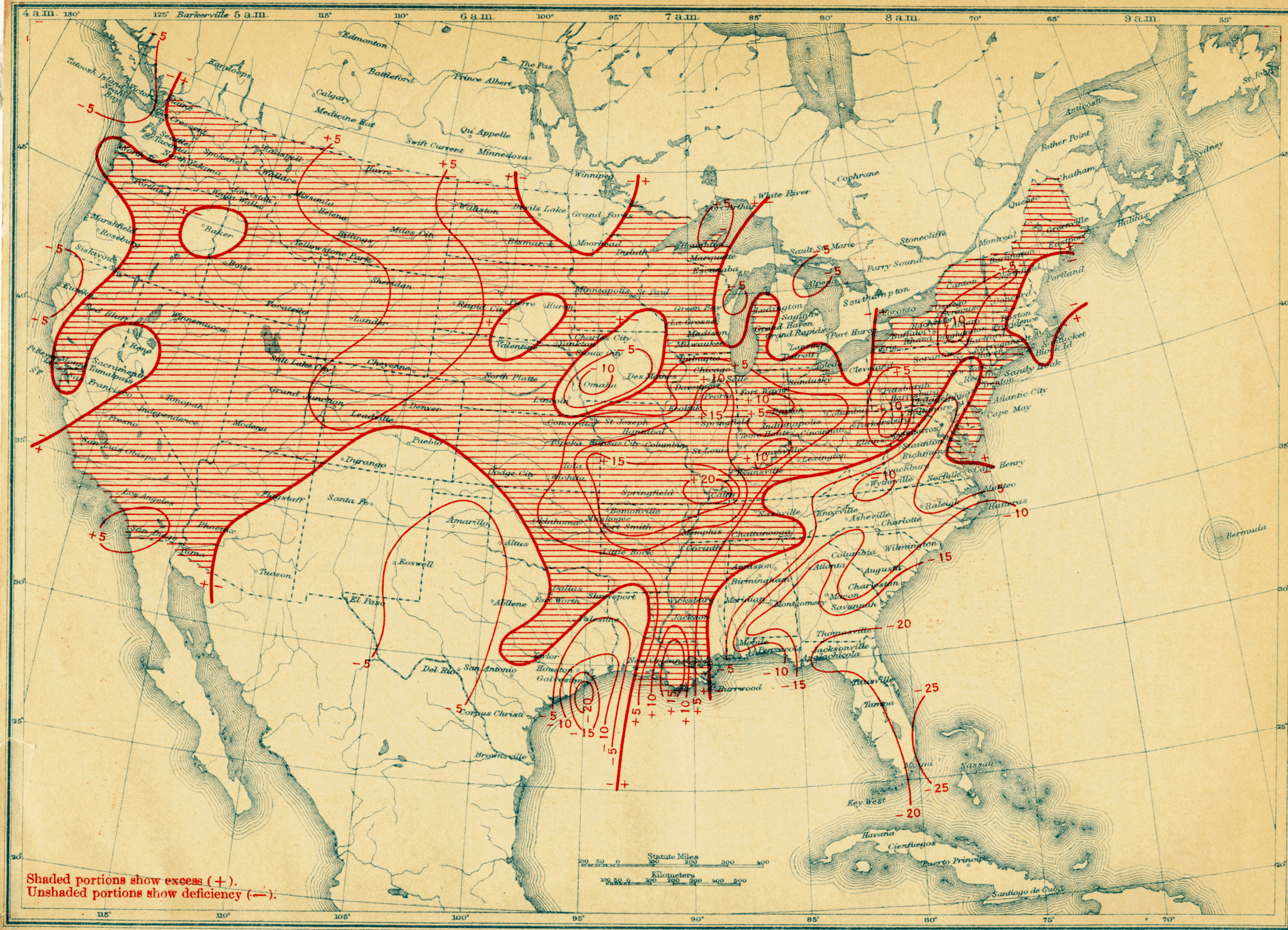
Tables 1 and 2 below contain the statistics of the two most important climatic elements, temperature and precipitation, for 1927.

Weather Bureau officials have sought for a number of years a method of presenting the climatic statistics of continental United States as a single geographic unit in a more satisfactory manner than is now followed. The difficulty lies in the greatly different physiographic features of the several divisions of the area and the unequal distribution of meteorological stations therein. Readers of the REVIEW will recognize in Tables 1 and 2 the same geographic districts as are carried in Table 1 of the MONTHLY WEATHER REVIEW. It is therefore a matter of the saving of much labor to present in a single table the mean values for the several districts combined in an annual mean. It is granted that the combination of the 21 district means into a single mean is meaning-

I. Annual Temperature Departures (°F.) in the United States, 1927



II. Annual Precipitation Departures (inches) in the United States, 1927



less, nevertheless it affords a ready means of comparing one year with another and that is the chief reason for continuing the practice.

Whatever method of determining the annual means of temperature and precipitation be adopted it is clearly shown by the figures of Table 1 that the year as a whole was a warm one in practically all parts of the country. (Chart 1.)

For precipitation, however, the statistics of Table 2 as presented on chart 2 seems to be at variance with the very general impression that the early part of the year, at least was unusually wet in the Mississippi Basin.

It is not possible to get from Table 2 any clear view of the rainfall distribution in the Mississippi Basin because the geographic districts in that table not only do not coincide with those within that basin but also they contain large areas without the basin in which precipitation was as a rule deficient. The Atlantic coast States and the East Gulf States had greatly reduced rainfall in the great majority of months of 1927, one great rainstorm in western New England in November being an exception.

The year was rather rich in calamitous events due to atmospheric phenomena; a single tornadic storm swept through a closely built up section of St. Louis, Mo., causing a large number of deaths and injuries and a vast property loss. Two calamitous floods, one in the Mississippi Basin, the other in western New England, completed the record of the year.

While unfavorable weather at times was harmful to crops favorable weather later in the season made up the damage and the final result was a crop yield above the 10-year average.

TABLE 1.—*Monthly and annual temperature departures, 1927*

District	January	February	March	April	May	June	July	August	September	October	November	December	Average monthly departure
New England	+1.6	+3.3	+4.7	+0.2	−2.2	−2.3	−0.4	−2.9	+0.8	+3.4	+5.5	+2.7	+1.2
Middle Atlantic	0.0	+6.6	+4.2	−1.3	−1.2	−3.5	−0.9	−4.6	+1.1	+2.6	+4.5	+1.8	+0.8
South Atlantic	+0.8	+8.9	+2.2	+1.3	+1.5	−1.2	−0.8	−1.6	+2.1	+2.3	+4.1	+0.2	+1.6
Florida Peninsula	−0.2	+5.7	+0.6	+2.2	+2.4	+2.6	+1.3	+1.4	+0.3	+0.2	+1.4	−0.2	+1.5
East Gulf	+3.0	+8.7	+1.0	+4.0	+1.4	0.0	+0.2	−0.8	+2.3	+2.6	+5.4	−0.8	+2.2
West Gulf	+3.4	+6.2	+0.3	+3.7	+3.3	−0.8	−0.3	+0.6	+1.6	+3.3	+7.4	−3.0	+2.1
Ohio Valley and Tennessee	+0.7	+7.8	+3.6	+1.3	−0.5	−3.8	−0.8	−4.8	+3.2	+3.1	+4.8	−0.6	+1.2
Lower Lakes	−0.4	+5.9	+5.7	−0.1	−2.1	−4.2	−1.1	−4.4	+2.6	+3.4	+4.4	+0.9	+0.9
Upper Lakes	−0.9	+6.0	+6.9	+0.7	−2.3	−2.7	−1.6	−3.8	+3.2	+3.1	+0.9	−2.9	+0.6
North Dakota	+5.8	+5.8	+8.6	+1.5	−5.7	−1.2	−2.7	−1.6	+0.4	+4.2	−5.5	−13.5	−0.3
Upper Mississippi Valley	+0.9	+8.8	+5.7	+0.3	−2.3	−3.3	−1.7	−4.0	+3.4	+3.7	+1.9	−4.9	+0.7
Missouri Valley	+3.9	+8.5	+3.4	+1.6	−1.1	−2.1	−1.4	−4.2	+1.9	+4.6	+0.1	−8.1	+0.6
Northern Slope	+1.7	+3.7	+1.7	−1.3	−3.0	−0.6	−0.3	−2.7	−1.3	+4.0	+0.2	−11.6	−0.8
Middle Slope	+3.8	+5.8	−1.0	+2.2	+2.4	−1.4	−1.0	−4.7	0.0	+4.2	+3.5	−5.6	+0.7
Southern Slope	+3.1	+5.4	+0.2	+3.0	+5.6	−0.4	0.0	+1.6	+0.6	+2.9	+7.5	−4.2	+2.1
Southern Plateau	+4.7	+3.9	−0.4	+1.2	+1.9	−0.1	+1.3	−0.6	0.0	+1.6	+4.5	−2.5	+1.3
Middle Plateau	+3.9	+3.4	−0.3	−0.4	−0.6	+1.5	+2.0	−1.4	−1.5	+2.6	+4.6	−3.9	+0.8
Northern Plateau	+1.4	+4.4	−0.4	−1.8	−2.8	+1.6	+2.0	+0.6	−2.4	+2.7	+4.3	−6.5	+0.3
North Pacific	+0.9	+2.7	−0.4	−0.2	−1.0	+1.9	+1.2	+1.5	+0.7	+1.7	+1.7	−3.3	+0.6
Middle Pacific	+1.5	+1.7	−0.6	+0.3	−0.2	+1.0	+0.9	−0.5	−0.4	+1.4	+1.2	−1.0	+0.4
South Pacific	+1.5	+1.7	−0.2	+0.2	+0.9	−0.6	+0.9	−0.7	−1.6	+2.0	+2.9	+0.2	+0.6
United States	+2.0	+5.5	+2.2	+0.9	−0.3	−0.9	−0.2	−1.8	+0.8	+2.8	+3.1	−3.2	+0.9

TABLE 2.—*Monthly and annual precipitation departures, 1927*

District	January	February	March	April	May	June	July	August	September	October	November	December	Accumulated departures for the year
New England	−0.9	−0.6	−2.3	−1.6	−0.4	−0.5	+0.8	+2.7	−0.9	+0.6	+2.3	+1.2	+0.4
Middle Atlantic	−1.7	−0.1	−2.1	+0.2	−0.5	−0.4	+0.3	+0.5	−1.3	+2.8	+0.4	+1.2	−0.7
South Atlantic	−2.7	−0.7	−1.1	−1.6	−2.4	+0.3	−0.2	−1.0	−2.8	−0.6	−1.1	+1.9	−12.0
Florida Peninsula	−1.8	+0.1	−0.9	−1.0	−3.9	−4.1	−1.1	−2.0	−2.3	−0.2	−1.8	−1.0	−20.0
East Gulf	−3.9	+2.3	−0.9	−0.6	−1.2	+0.9	−1.1	−0.8	−2.2	−0.9	−0.1	+2.7	−5.8
West Gulf	−0.9	−0.3	+0.1	+1.6	−1.4	+1.4	−0.3	−1.4	−0.9	+0.7	−1.4	+1.2	−1.6
Ohio Valley and Tennessee	+0.3	−0.4	+1.5	+2.1	+1.2	−0.8	−0.1	−0.6	−0.4	0.0	+1.6	+0.3	+4.7
Lower Lakes	−0.9	+0.2	−0.4	−0.4	−0.6	−1.7	+0.7	−0.8	−1.0	+0.1	+4.4	+0.7	+0.3
Upper Lakes	−0.8	−0.5	−0.2	+0.3	+0.7	−1.3	+0.5	−2.0	+0.9	+0.6	+1.1	+0.7	0.0
North Dakota	−0.1	0.0	0.0	0.0	+2.5	−0.6	−1.2	+0.6	−0.5	+0.1	0.0	+0.4	+1.2
Upper Mississippi Valley	−0.1	−0.6	+1.6	+1.3	+2.1	−0.6	−1.3	−1.1	+2.2	+0.9	+0.7	+0.4	+5.5
Missouri Valley	−0.2	−0.4	+1.8	+2.4	0.0	−0.1	−0.8	+0.9	0.0	+0.5	+0.1	+0.1	+4.3
Northern Slope	−0.3	−0.1	−0.1	+0.5	+1.3	−0.3	−0.1	+1.0	+0.8	+0.2	+0.6	0.0	+3.5
Middle Slope	−0.2	+0.2	+0.8	+1.0	−2.4	+0.8	+0.3	+2.5	+0.4	+0.5	−0.6	−0.2	+3.1
Southern Slope	−0.4	+0.4	−0.5	+0.1	−2.4	−0.9	−0.9	−0.6	+0.1	−0.9	−1.1	−0.4	−7.5
Southern Plateau	−0.6	+0.3	−0.1	−0.1	−0.3	+0.4	−0.4	0.0	0.0	−0.1	−0.4	+0.2	−1.1
Middle Plateau	−0.3	+0.8	+0.6	−0.5	0.0	+0.4	−0.1	+0.4	+0.7	+0.3	+0.4	+0.1	+2.8
Northern Plateau	0.0	+0.2	−0.2	−0.5	−0.3	+0.3	−0.2	+0.1	+2.3	0.0	+1.6	−0.6	+2.7
North Pacific	−0.5	+1.3	−1.0	−0.9	+0.1	−0.6	−0.4	+0.1	+1.0	+1.0	+1.4	−3.6	−2.1
Middle Pacific	−1.0	+2.5	−2.0	−0.2	−0.6	+0.1	0.0	0.0	−0.4	−0.1	+0.3	−1.2	−2.6
South Pacific	−1.2	+4.0	−0.7	−0.1	−0.5	0.0	0.0	0.0	−0.1	+1.4	−0.6	+0.7	+2.9
United States	−0.9	+0.4	−0.3	+0.1	−0.4	−0.3	−0.3	−0.1	−0.2	+0.3	+0.4	+0.2	−1.1